

Taxonomic Notes on *Ophiopogon* (Convallariaceae) of East Asia (II)

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Ophiopogon reversus C.C.Huang, so far recorded from Hainan Island and western Guangxi (southern China), has also been found in Hongkong (China), Taiwan, and Yonaguni Island of the southern Ryukyus (Japan). Specimens of this species have hitherto often been assigned to other species such as *O. japonicus* (Thunb.) Ker Gawl., *O. jaburan* (Siebold) Lodd. and *O. planiscapus* Nakai. *Ophiopogon reversus* is regarded as closely allied to both *O. japonicus* and *O. jaburan*. It is noteworthy that within this genus only these three species have diurnal flowers. A key to these three species is provided.

(Continued from J. Jpn. Bot. 76: 59–76, 2001)

Key words: Distribution, *Ophiopogon reversus*, *Ophiopogon japonicus*, *Ophiopogon jaburan*, taxonomy

3) *Ophiopogon reversus* in comparison with *O. japonicus* and *O. jaburan*

Ophiopogon reversus was described by Huang (1977) from Hainan Island, southern China (Fig. 1). Recently, Li (1999) recorded it from western Guangxi (S China). It became evident in the present survey that this species also occurs in Hongkong (S China) (Fig. 2), Taiwan (e.g., Figs. 3, 5A, 5B), and Yonaguni Island of the southern Ryukyus (SW Japan) (e.g., Figs. 4, 5C).

Ophiopogon reversus shares many common features with *O. japonicus* and *O. jaburan*, such as thick fibrous roots (e.g., Figs. 2, 4), a thick style (Figs. 7C, 8B, Table 1), an ovary slightly convex at the apex (Figs. 7C, 8B), and diurnal flowers¹⁾. Within the genus, it is only these three species that are known to have diurnal flowers (cf. Tanaka 2001). Hence, these three species are regarded as closely related. These three species are compared with each other, as to vari-

ous characters, in Table 1.

Ophiopogon jaburan (e.g., Figs. 5E, 6C, Table 1) is generally a larger plant than *O. japonicus* (e.g., Figs. 5D, 6A, Table 1; Ohwi 1965, Tanaka 2001). *Ophiopogon reversus* (e.g., Fig. 1) is often intermediate in size between the two species. *Ophiopogon reversus* is highly variable (e.g., Figs. 1–4, Table 1), and many characters of it overlap in the range of variation with *O. jaburan* and *O. japonicus* (cf. Table 1; e.g., the length of leaves, scapes, inflorescences and anthers, the number of flowers in the axils of bracts, flowering time, and the size of seeds). In general appearance, the large form with long and wide leaves of *O. reversus* (Fig. 2) closely resembles *O. jaburan*, and the small form with short and narrow leaves (Fig. 3) closely resembles *O. japonicus*. The differences between *O. reversus* and the two other species are sometimes subtle, but they appear to be distinguishable from each other.



Fig. 1. Type specimen of *Ophiopogon reversus* from Hainan Isl., China (C. L. Tso & N. K. Chun 43625, IBSC 44875).

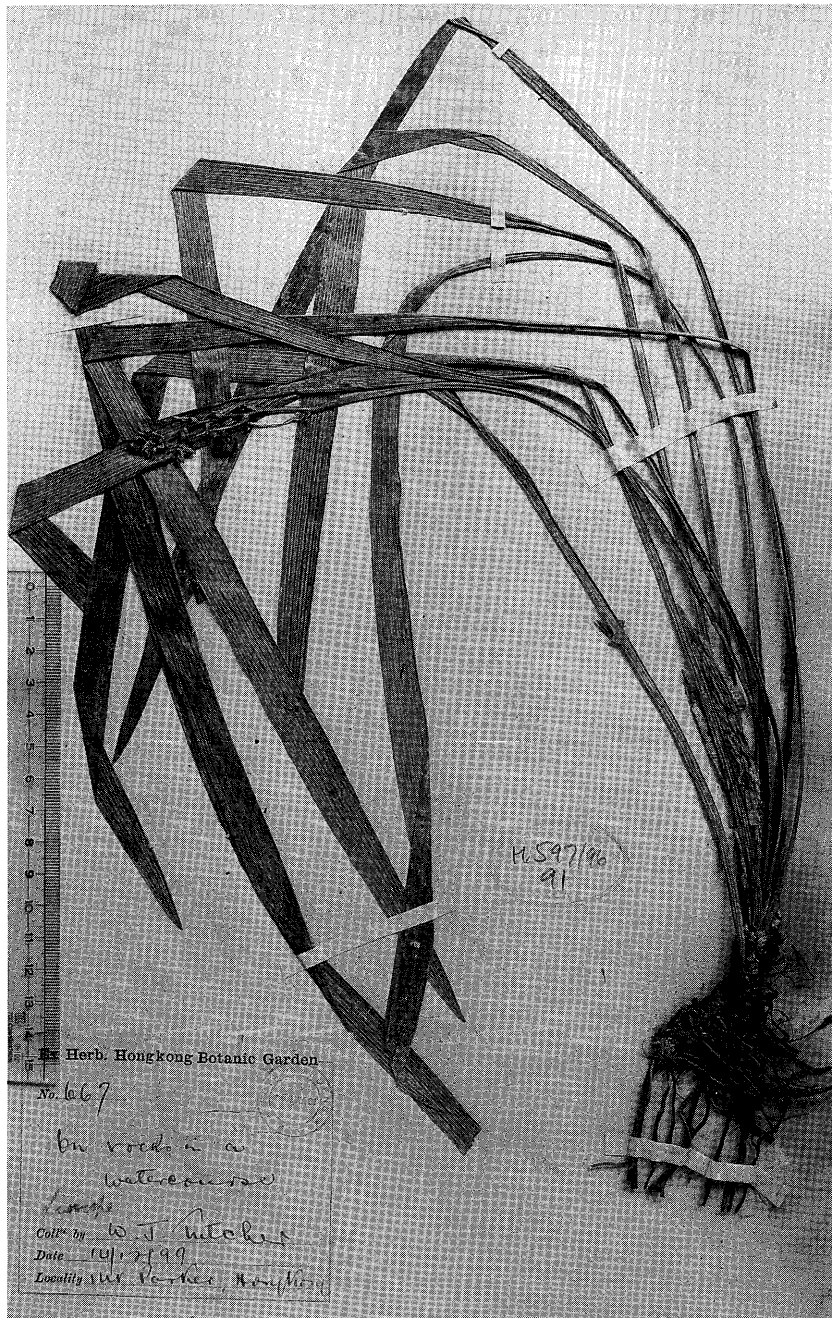


Fig. 2. *Ophiopogon reversus* from Hongkong, China (W. J. Tutcher 667, K).

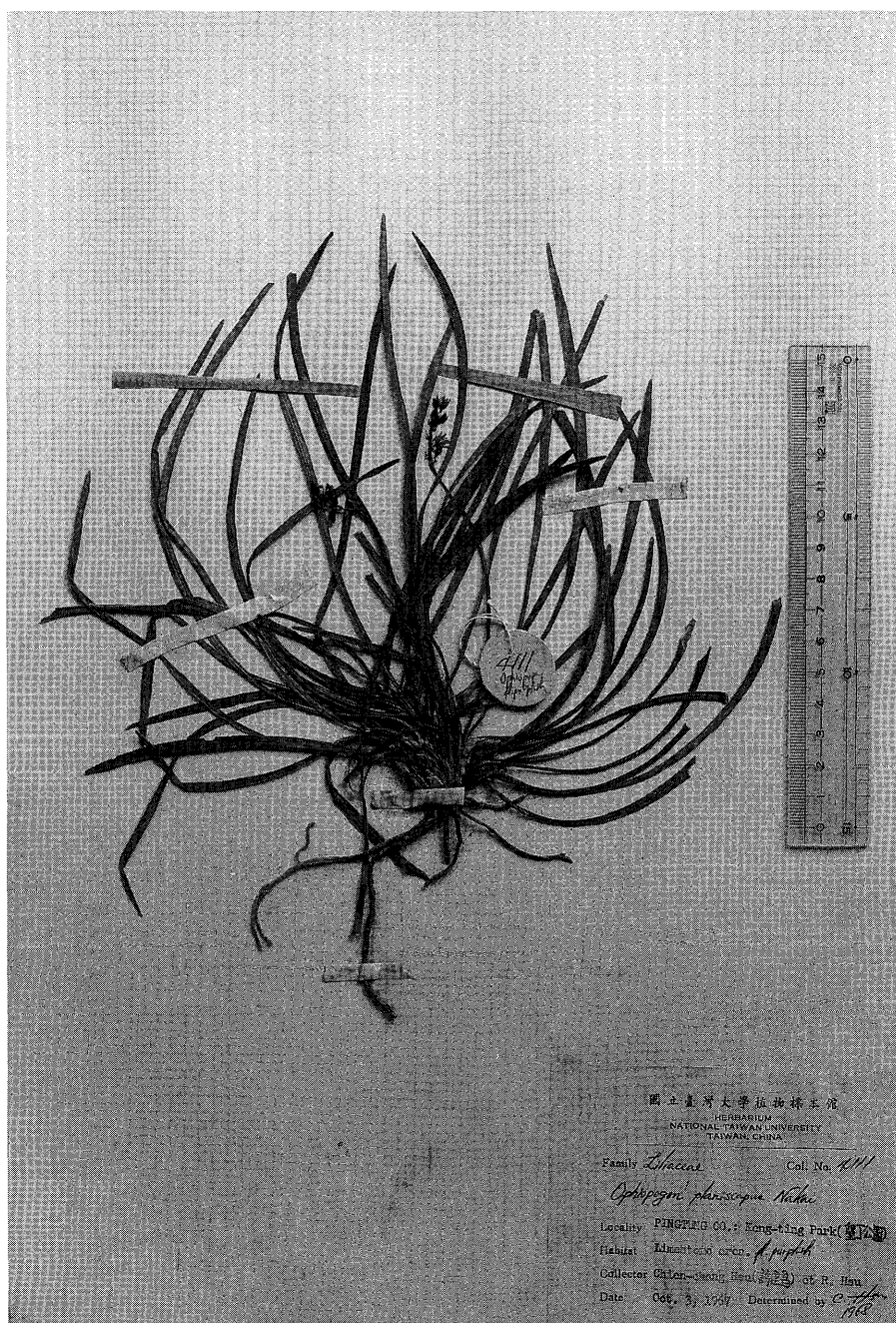


Fig. 3. *Ophiopogon reversus* from southern Taiwan (C. C. Hsu 4111, TAD).

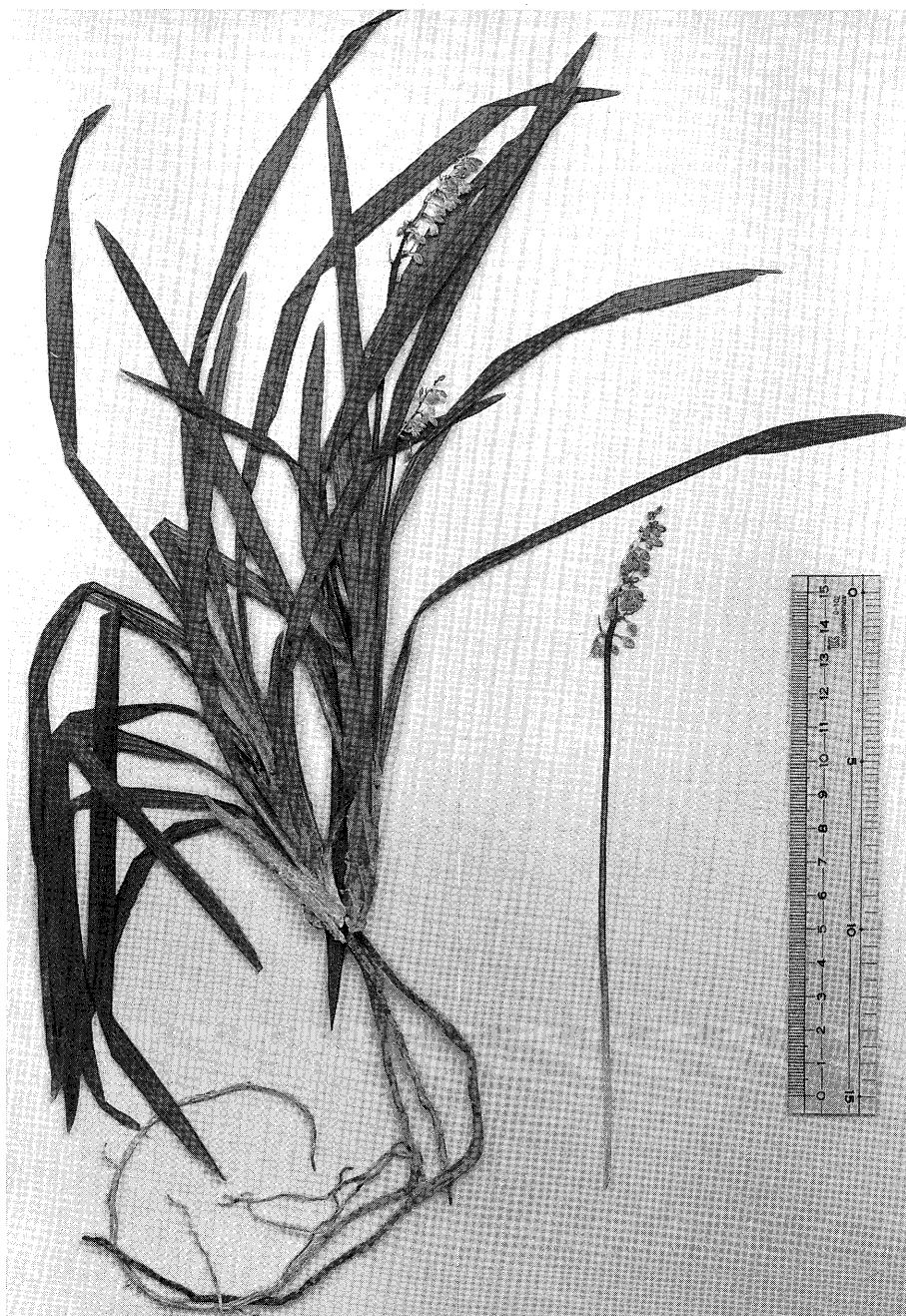


Fig. 4. *Ophiopogon reversus* from Yonaguni Isl., southern Ryukyus, Japan [collected on Jul. 27, 1993, cultivated at Teikyo Univ. (acc. no. 9), Oct. 16, 1994 (right scape), Oct. 27, 1994 (left specimen), N. Tanaka s.n., Herb. Teikyo Univ.].



Fig. 5. *Ophiopogon reversus* (A–C), *O. japonicus* (= *O. umbraticola*; D) and *O. jaburan* (E), bearing flowers. A. Habit. From Hualien, E Taiwan. Photo on Jul. 24, 1995. B. Inflorescence. Material and photo data same as in A. Floral buds tinged purple. C. Inflorescence. From Mt. Kubura, Yonaguni Isl., S Ryukyus, Japan, acc. no. 15. Photo on Oct. 22, 1995. In both B and C, anthers are creamy. D. From Hongkong, acc. no. A-4. Photo on Oct. 22, 1995. E. From Enoshima Isl., Kanagawa Pref., Japan. Photo on Aug. 24, 1996. Anthers tinged green. All plants cultivated at Teikyo University. All photos taken at the same university.

Table 1. Comparison of *Ophiopogon japonicus*, *O. reversus* and *O. jaburan*

	<i>O. japonicus</i>	<i>O. reversus</i>	<i>O. jaburan</i>
Stolon	present or absent	absent or short stolons occasionally present	absent or short stolons occasionally present
Root tuber	present, ellipsoidal to fusiform	none or slenderly fusiform when present	none or slenderly fusiform when present
Leaf: length (cm)	10–57	12–77	35–81
width (mm)	1.5–5	3–13	6–17.5
Scape: form	ancipital or nearly triquetrous	ancipital	ancipital
length (cm)	5–34	10.5–45	32–73.6
width (mm)	1–2.5	1–3.5 (–4.2)	2.7–8
Inflorescence length (cm)	1.5–18	1.5–9	4.2–15
Inflorescence length / scape length	over 1/3 (–1/4)	under (1/3–)1/4	under ca.1/5
Number of flowers in axils of bracts	1–3 (–4)	1–3 (–4)	(1–) 2–6 (–10)
Articulation site on pedicel	variable, usually around middle or in lower part	usually in or above middle	usually in or below middle
Pedicel length incl. basal stalky part of perianth (mm)	2.7–12.5	3–9	9.2–22
Length of basal stalky part of perianth (mm)	1–4.5	1–3.2 (–5)	3.2–11
Colour of perianth	white, lilaceous or purplish	white to purplish	white, rarely tinged lilac
Length of perianth lobes (mm)	3.5–5.8	3.5–5.2 (–6)	(4.6–) 5–7.8
Anther: colour	creamy	creamy	tinged green
length (mm)	2.3–3.6	2.5–4.3	3.3–4.5
width at base (mm)	0.7–0.9	0.9–1.1	0.9–1.3
Style: shape and width at base (mm)	subulate-pyramidal, often abruptly narrowing at apex (or subobtusely) 1–1.4	subulate-pyramidal 0.7–1.2	subulate 0.6–0.9
Flowering habit	diurnal	diurnal	diurnal
Flowering time	(late May–) Jun.–Sept. (–Dec.)	Jun.–Nov. (–Dec.)	Aug.–Oct.
Seeds: shape	globular to ellipsoidal	ovoid to ellipsoidal	ovoid to ellipsoidal
size (mm)	6–12 × 4–11	6–12 × 5.3–9	8–14 × 5.6–9.7
colour	blue (–deep blue)	blue (–deep blue)	blue (–deep blue)
Distribution	coastal and inland	mostly coastal	coastal

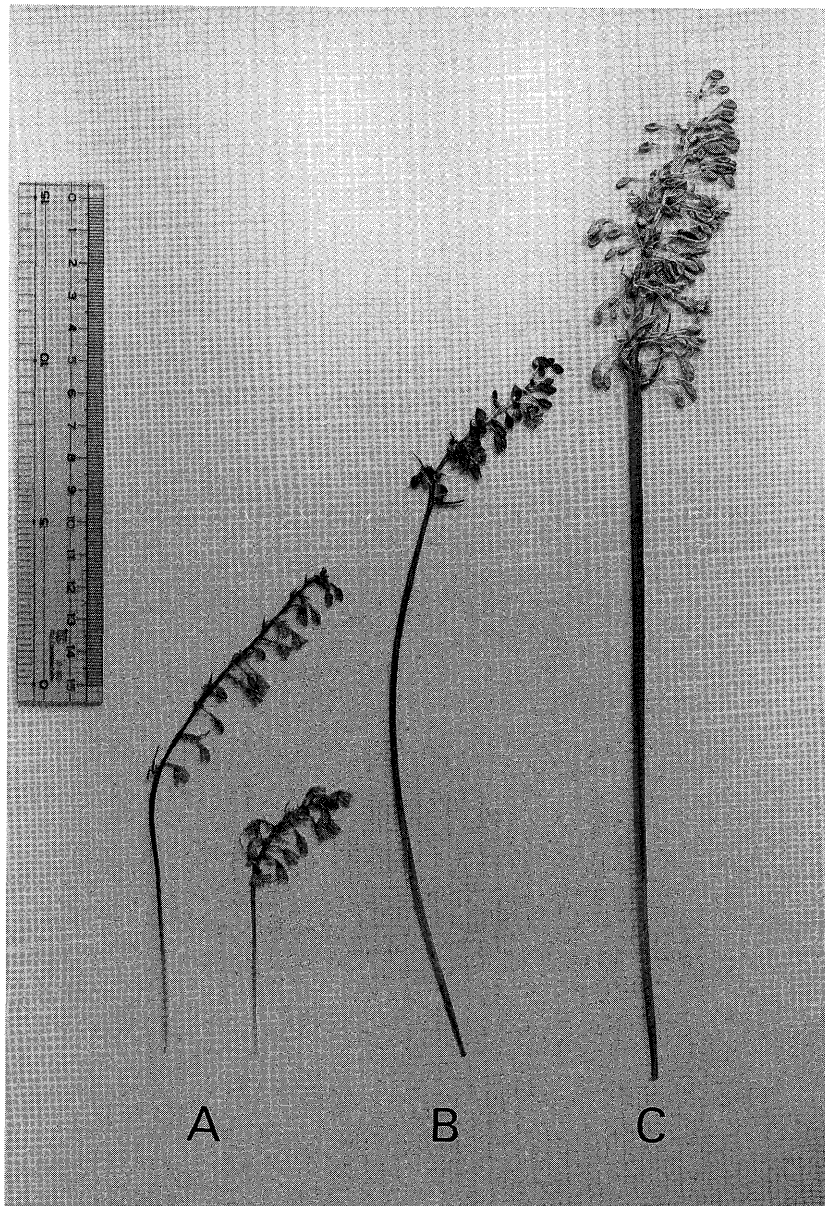


Fig. 6. Scapes of *Ophiopogon japonicus* (= *O. umbraticola*; two scapes in A), *O. reversus* (B) and *O. jaburan* (C). A. From Hongkong. Left: acc. no. D-5 (cultivated at Teikyo Univ., Oct. 31, 1995). Right: acc. no. A-1 (cultivated at Teikyo Univ., Oct. 28, 1995). B. From Hualien, E Taiwan (cultivated at Teikyo Univ., Jul. 25, 1995). C. From Enoshima Isl., Kanagawa Pref., Japan (cultivated at Teikyo Univ., Sept. 1, 1996). All materials (Tanaka s.n.) in Herb. Teikyo Univ.

Ophiopogon reversus has the following features when compared with *O. japonicus*: ellipsoidal root tubers are not formed (Table 1), the leaves are often wider (Figs. 1, 2, 4, Table 1), the scapes are always ancipital (Table 1), the proportion of the inflorescence to the entire scape is usually smaller (Figs. 1–4, 6A, 6B, Table 1), the anthers are usually slightly larger (Fig. 7B, Table 1), the style is more often strongly tapering to the top (Fig. 7C, Table 1), and the seeds are not globular (either ovoid or ellipsoidal, Fig. 8C-left, Table 1) (see also the key below, and Table 1 for some other features).

When compared with *Ophiopogon jaburan*, *O. reversus* is characterized as follows: the pedicels (incl. the basal stalky part of the perianth) are shorter (e.g., Figs. 3, 4, 5B, 5C, 5E, 6B, 6C, 8A–8C, Table 1) and articulate more often above the middle, the anthers are creamy (Figs. 5B, 5C, Table 1) (vs. greenish in *O. jaburan*: Fig. 5E), the leaves are usually narrower (Fig. 3, Table 1), the scapes are also usually narrower (e.g., Figs. 6B, 6C, Table 1), the number of flowers in the axils of bracts tends to be fewer (e.g., Figs. 5B, 5C, 5E, 6B, 6C, Table 1), the flowers are usually smaller (e.g., perianth lobes are usually shorter; Figs. 8A, 8B, Table 1), the style is often more strongly tapering to the top (Fig. 8B, Table 1), and the seeds (incl. testa) are a little smaller (Fig. 8C, Table 1) (see also the key below, and Table 1 for some other features).

The specimens of *Ophiopogon reversus* from Taiwan have hitherto often been identified as *O. japonicus* or possibly as *O. japonicus* var. *umbraticola*. Under the name *O. japonicus*, Wright (1903) cited two specimens collected by A. Henry in Taiwan; Henry 1098A from Ape's Hill (K), and Henry 1703A from South Cape (K). Matsumura and Hayata (1906) also recorded *O. japonicus* from Taiwan, quoting the two localities of Henry's specimens. However, in my observation these two specimens are

assignable to *O. reversus*. Since Wright (1903) and Matsumura and Hayata (1906), *O. japonicus* has repeatedly been recorded from Taiwan (e.g., Kawakami 1910, Hayata 1917, Makino and Nemoto 1925, 1931, Sasaki 1928, 1930, Masamune and Shimada 1936, Hsieh and Yang 1969, Liu and Ying 1978, Yang 1982). But, I have seen no specimens of true *O. japonicus* growing wild in Taiwan. Wright (1903) also recorded *O. japonicus* var. *umbraticola* from Takao (Kaohsiung), southwestern Taiwan, citing a specimen (Playfair no. 85, K). I have examined this specimen, and found that it is undoubtedly a species of *Liriope*. Matsumura and Hayata (1906) also recorded the same variety from Takao (Takow). Since then, this variety has also frequently been recorded from Taiwan (e.g., Kawakami 1910, Hayata 1917, Makino and Nemoto 1925, 1931, Sasaki 1928, Masamune and Shimada 1936, Hsieh and Yang 1969). Most of the literature recording this variety from Taiwan also cited Takao as its locality. However, I have seen no specimens of this variety in the strict sense (for this variety see Tanaka 2001) from Taiwan. Instead, I found that *O. reversus* is widely distributed in Taiwan, including Takao.

Ophiopogon japonicus has also been recorded from Hainan Island (Groff et al. 1923, Merrill 1927, Tanaka and Odashima 1938, Masamune 1943). But, the specimens (McClure 8326, Schaeffer s.n.) which some authors (Groff et al. 1923, Merrill 1927) cited as *O. japonicus* are also *O. reversus*.

Some specimens of *Ophiopogon reversus* have also been identified as *O. planiscapus* (Hsu 1971, 1972; e.g., a specimen shown in Fig. 3). But, *O. planiscapus* differs from *O. reversus* by its slender roots, long stolons, day-neutral flowers which last for several days, etc. In Taiwan, true *O. planiscapus* has not been seen.

Some botanists recorded *Ophiopogon jaburan* from Yonaguni Island of the south-

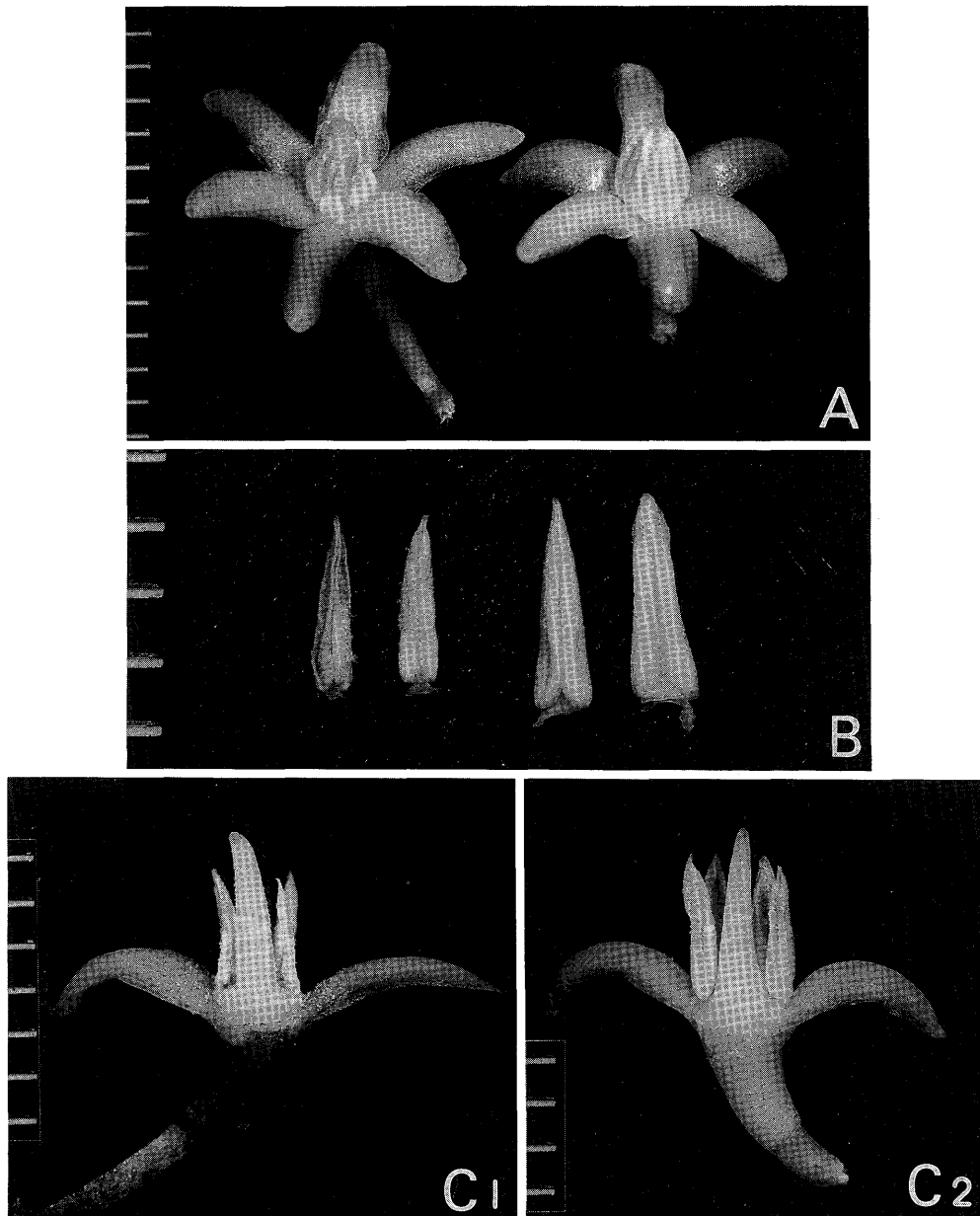


Fig. 7. Flowers of *Ophiopogon japonicus* (= *O. umbraticola*) and *O. reversus*. A. Flowers. Left, *O. japonicus* (Hongkong, acc. no. D-4). Right, *O. reversus* (Mt. Kubura, Yonaguni Isl., acc. no. 14). B. Anthers. Left two, *O. japonicus* (Hongkong, acc. no. D-10). Right two, *O. reversus* (Mt. Kubura, Yonaguni Isl., acc. no. 3). C (C1, C2). Partial flowers with some tepals and anthers removed, showing shape of style, etc. C1, *O. japonicus* (Hongkong, acc. no. D-4). C2, *O. reversus* (Mt. Kubura, Yonaguni Isl., acc. no. 5). All plants cultivated at Teikyo University. Scales in mm.

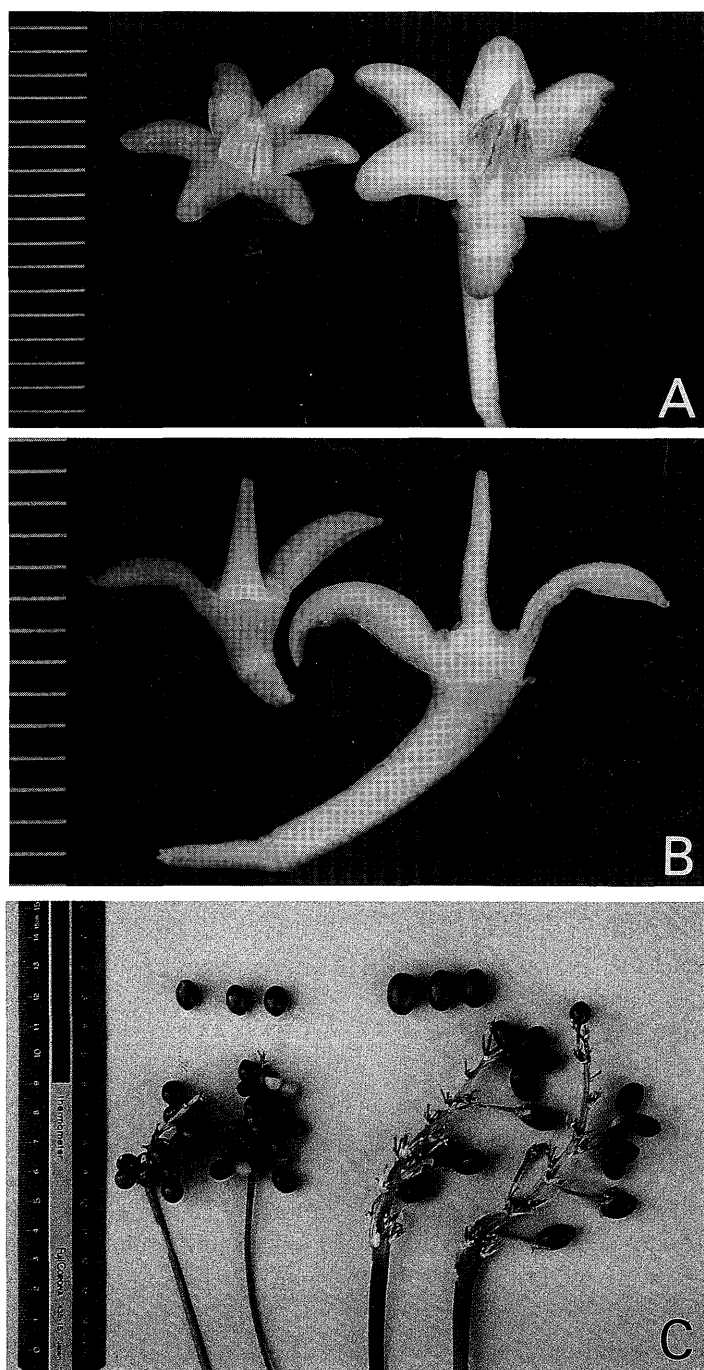


Fig. 8. Flowers and fruiting scapes of *Ophiopogon reversus* and *O. jaburan*. A. Flowers. Left, *O. reversus* (Mt. Kubura, Yonaguni Isl., acc. no. 10). Right, *O. jaburan* (Mt. Yaedake, Okinawa Isl., acc. no. 3). B. Partial flowers showing shape of style, etc. Material same as in A. C. Fruiting scapes. Left two, *O. reversus* (Hualien, E Taiwan). Right two, *O. jaburan* (cultivated at Ueno, Tokyo, collected on Mar. 9, 1997, Tanaka s.n., Herb. Teikyo Univ.). Photo on March 9, 1997 at Teikyo Univ. All plants, except those from Ueno, cultivated at Teikyo university. Scales in A and B in mm.

ern Ryukyus (e.g., Fujimoto 1972, Walker 1976, Miyawaki et al. 1978). But, I have seen no specimens of true *O. jaburan* from the island. When botanizing this island (Jul. 1993), I found *O. reversus* (e.g., Figs. 4, 5C) but not *O. jaburan*. As *O. reversus* on this island closely resembles *O. jaburan*, it is likely that *O. reversus* has been recorded as *O. jaburan* [e.g., Hatusima et al. 35988 from Yonaguni Isl. (RYU) is labelled *O. jaburan*, but it is nothing but *O. reversus*] (Tanaka 2001).

Hsu (1972) reported that *Ophiopogon jaburan* occurs on Lanyu Island (Lanhsü; Botel Tobago Isl.; Orchid Isl.), southeast Taiwan. The specimen which he identified as *O. jaburan* (C. C. Hsu 4964, TAI) is also referable to *O. reversus*.

At present, Yonaguni Island is the northeasternmost locality of *Ophiopogon reversus*. There is a possibility that this species will also be found on some other islands of the southern Ryukyus in the future.

Key to *Ophiopogon reversus*, *O. japonicus* and *O. jaburan*

1. Stolon present or absent. Root tubers often ellipsoidal. Leaves 1.5–5 mm wide. Scape 1–2.5 mm wide, ancipital or nearly triquetrous. Inflorescence usually more than 1/3 (–1/4) of scape length. Seeds often globular
.....*O. japonicus* (see Tanaka 2001)
1. Stolon absent or short stolon occasionally present. Root tubers none or slenderly fusiform when present. Leaves 3–17.5 mm wide. Scape 1–8 mm wide, ancipital. Inflorescence less than (1/3–)1/4 of scape length. Seeds not globular2
2. Leaves 3–10.6 mm wide. Scape 1–3.5 (–4.2) mm wide. Flowers 1–3(–4) in axils of bracts. Pedicels 3–9 mm long [basal stalky part of perianth 1–3.2(–5) mm long], articulate usually in or above middle. Floral buds often tinged green, purple or both. Perianth usually white to

purplish. Perianth lobes 3.5–5.2(–6) mm long. Anthers creamy... *O. reversus*

2. Leaves 6–17.5 mm wide. Scape 2.7–8 mm wide. Flowers 1–6(–10) in axils of bracts. Pedicels 9.2–22 mm long (basal stalky part of perianth 3.2–11 mm long), articulate usually in or below middle. Floral buds white. Perianth white, rarely tinged lilac. Perianth lobes (4.6–)5–7.8 mm long. Anthers greenish*O. jaburan* (see Tanaka 2001)

Ophiopogon reversus C.C.Huang., Fl. Hainan. 4: 111 (sine descr. lat.), 534 (1977); L.K.Dai & S.C.Chen in F.T.Wang & Ts.Tang (eds.), Fl. Reipub. Pop. Sin. 15: 160 (1978). TYPE: China. Hainan Prov., Hainan Isl.: Lingshui, fls. purple tinged white slightly, Aug. 22, 1932, fl.(buds), C.L.Tso & N.K.Chun 43625 (holotype ?, IBSC 44875!).

[Figs. 1–4, 5A–5C, 6B, 7A–7C (in part), 8A–8C (in part); Table 1 (in part)]

O. japonicus auct. non (Thunb.) Ker Gawl.: C.H.Wright in J. Linn. Soc. 36: 78 (1903), p.p., quoad specimina ex Formosa; Matsum. & Hayata in J. Col. Sci. Imp. Univ. Tokyo 22: 426 (1906), p.p., quoad spec. Formos.; Dunn & Tutchener in Roy. Bot. Gard. Kew. Bull. Misc. Inf. Add. Ser. 10: 274 (1912), p.p.; G.W.Groff & al. in Lingn. Agr. Rev. 1 (2): 62 (1923); Merr. in Lingn. Sci. J. 5: 48 (1927); Masam., Fl. Kainant. 404 (1943), p.p., quoad pl. Hainan.

O. formosanus Hayata in shed. [Taiwan. Taihoku (Taipei Co.), Shinkô (Shenkeng), Shirakku. Juli 1906, U. Mori s.n. (TI!)], non Ohwi, 'formosana', nom. inval.

O. planiscapus auct. non Nakai: C.C.Hsu in Taiwaniana 16 (1): 125 (1971), saltem quoad specim. 'Hsu 4111'; in Taiwaniana 17 (1): 51 (1972).

O. jaburan auct. non (Siebold) Lodd.: C.C. Hsu in Taiwaniana 17 (1): 51 (1972).

O. formosanus auct. non Ohwi: T.S.Liu & S.S.Ying in H.L.Li & al. (eds.), Fl. Taiwan 5: 65 (1978), quoad specim. cit. 'Suzuki

7505'.

O. intermedius auct. non D. Don: Anonym. in Fl. Hainan. 4: 111, quoad syn. cit. '*O. japonicus* sensu Merr.'.

Glabrous perennial herb. Rootstock stout, short, occasionally elongate shortly. Roots fibrous, usually to 4 mm in diameter, occasionally forming slender fusiform tubers. Leaves many, radical, tufted, linear to linear oblanceolate, attenuate at both ends, sheathing at base, serrulate on margins especially in upper part, 5–12-nerved, 12–77 cm long, 3–13 mm wide. Scapes complanate, narrowly 2-winged, often purplish, 10.5–45 cm long, 1–3.5(–4.2) mm wide. Inflorescence racemose, 1.5–8 cm long, usually less than (1/3)–1/4 of entire scape length. Flowers 1–4 in axils of bracts, diurnal^{b)}, faintly fragrant. Pedicels 3–9 mm long [incl. basal stalky part of perianth which is 1–3.2(–5) mm long; true pedicels excl. perianth part 2–7 mm long], jointed usually in or above middle. Bracts ovate to lanceolate, acuminate, scarious at margin, almost entire or slightly serrulate in upper part, to 2.4(–5.5) cm long. Floral buds often tinged green, purple or both especially in upper part. Perianth white to purplish; lobes 6, ovate-oblong or ovate-lanceolate, round at apex, fleshy, marginally membranous, 3.5–5.2(–6) mm long, 1.5–2.5(–2.9) mm wide, recurved. Stamens 6; anthers lanceolate, 2.5–4.3 mm long, 0.9–1.1 mm wide at base, creamy; filaments very short. Pistil 1; style thick, subulate-pyramidal, trigonal, strict, 2.9–4.5 mm long, 0.7–1.2 mm at base; ovary semi-inferior, trilocular; ovules basal, anatropous, 2–5 per locule. Seeds coated with sarcotesta, ovoid or ellipsoidal, deep blue, glossy, 6–12 mm long, 5.3–9 mm across. Flowers from Jun. to Nov.(–Dec.).

Japanese name: Yonaguni-noshiran (nom. nov.).

The Japanese name 'Takao-janohige' or 'Janohige' has previously been applied to the plant here concerned. But, the former was originally applied to *Ophiopogon japonicus*

var. *umbraticola* (Hayata 1917) which is, according to the present study, not distributed in Taiwan. The latter Japanese name is for *O. japonicus*. So, to avoid any possible confusion, a new Japanese name is given to it here.

Chinese name: 高節沿階草 (Huang 1977), 広東沿階草 (Dai and Chen 1978).

Distribution: S China (Hainan Isl., Hongkong), Taiwan and SW Japan (Yonaguni Isl. of the southern Ryukyus.). Also reported from W Guangxi (Li 1999).

^{b)}The flowers of *Ophiopogon reversus* open in the morning or in the early afternoon (usually between 9 a.m. and 1 p.m.) and close in the late afternoon or in the evening (after about 4 p.m.) of the same day. The shortest duration of a flowering ever recorded is about 4 hours. Flowering is limited to once for each flower, not repeated. These observations were made on the plants from Hongkong, Taiwan and Yonaguni Isl., cultivated at the outdoor nursery of Teikyo university.

Other representative specimens examined:

CHINA. Hainan Prov., Hainan Isl.: Lingshui, alt. 1200 m, fls. purple tinged green, Oct. 20, 1935, fl., F. C. How 73922 (isoparatype, PE 379299); Qiongzong, alt. 140–190 m, fls. purple, Oct. 12, 1956, late fl., S. H. Chun 10570 (paratype, IBSC 225617); Qiongzong, alt. 500 m, Nov. 27, 1956, fr., L. Tang 3354 (paratype, IBSC 227682); Ya-xian, alt. 1400 m, Mar. 27, 1933, late fl., F. C. How 70445 (paratype, IBSC 375029); Ya-zhou, alt. 1200 ft, Dec. 31, 1932, fr., Chen 44735 (isoparatype, PE 510947); Poting, Nov. 3, 1935, fr., F. C. How 73975 (isoparatype, A); without precise loc., Dec. 1922, late fl., K.W.Schaeffer s.n.(UC 225227); Pak Shik Ling and vicinity, Ku Tung village, Ching Mai Distr., fr., C. I. Lei 449 (HK 7394); Ka la, Yik Tsok Mau, alt. 350 m, Dec. 4, 1921, fr., F. A. McClure 8326 (HK 28191); Ue Lung Shan, Ch'ang-kiang Distr., Jan. 12, 1934, fr., S. K. Lau 3139 (KYO).

Hongkong: Mt. Parker, Dec. 14, 1899, fr., W. J. Tutcher 667 (K); same mountain, Sept. 1966, Y. S. Lau 1234 (HK 29073); S.W. of Mt. Parker, Feb. 13, 1908, fr., W.J.Tutcher s.n.(HK 7388); cult. in the HK Bot. Gardens, originally from Mt. Parker, without other collection data (HK 7352); Mt. Parker, cult. in Bot. Gdns, Hongkong, Jul. 7, 1903, fl., W.J.Tutcher s.n. (HK 7378); Kadoorie Farm, Jul. 1981, fl., G.Barretto s.n. (HK 34412); same loc., fl. greenish violet, Jul. 1976, fl., without collectors's name (HK 32930); Hongkong, without other collection data, fl. (HK 7377); Mt. Taimoshan, fls. white tinged blue, Jul. 18, 1977, fl., L. T. Lo 358 (HK 33163); same mountain, Jan. 1972, fr.,

Y. S. Lau 1727 (HK 30554); N.W. of Mt. Taimoshan, alt. 600 m, Jul. 14, 1985, fl., G. Barretto 275 (HK 34543); collected on the Black Mt., Hongkong, in 1903 and cult'd in the Bot. Gdn., Jun. 27, 1905, without collector's name (HK 7379).

TAIWAN. Taipei Co.: In silvis monte inter Buta et Riyohen, Taihoku-syû, Jul. 11, 1932, T. Suzuki 7505 (TAI 29320); Kuei-shan-lu to Ta-tung-shan, alt. 200–700 m, Oct. 10, 1969, C. C. Hsu 6425 (TI).

Hsinchu Co.: Taiko (Tahu), Mabiruha, alt. 500 m, fls. purple, Jun. 23, 1928, fl.(buds), Y. Shimada 5097B (KYO).

Chiayi Co: Funkiko (Fenchihu), Arisan (Alishan), alt. 3000 ft, Feb. 26, 1912, fr., W. R. Price 59 (K); Arisan, 1912, fr., B. Hayata s.n. (TI).

Tainan Co.: Pai-ho-sui-ku, Aug. 21, 1972, C. S. Kuoh 3948 (TAI 159982).

Kaohsiung City & Co.: Apes Hill, Takaw, blue fls., A. Henry 1098A (K); Takao-syû, Kizan-gun, Rokki, Senpei (Shanping), 7/8, 1938, fl., S. Okamoto (KYO); Shanping, Mt. Nanphong-shan, Oct. 24, 1982, fl.–fr., Ohashi et al. 13374B (TAI 185257); Sanping, 7, 10, 1970, fl.(buds.), M. T. Kao 9220 (TAI 186294); same loc., Dec. 10, 1968, T. C. Huang 4940 (TAI 122311); Shanping, alt. 700–800 m, Oct. 23, 1982, Ohashi et al. 13171 (TI 1348011); Lioukue, Shuangsi, alt. ca. 100 m, Oct. 19, 1982, fl., Ohashi et al. 14895 (TI 1348008); Rokki (Lioukue), Sangoukei, Sept. 14, 1937, fl., S. Okamoto s.n. (TNS 214315, 214319); Mt. Buisan, Jan. 5, 1926, S. Sasaki s.n. (TNS 145742).

Pingtung Co.: South Cape, May 1894, fl., A. Henry 1703A (K); Kenting park, Oct. 5, 1970, fl., C. C. Hsu et al. (TAI 185097); same loc., fls. purplish, Oct. 3, 1967, fl., C. C. Hsu 4111 (TAI); Kentin, Mar. 1988, cult'd at Teikyo Univ., Tokyo, Oct. 23, 1990, fl., C. E. Chang s.n., (Herb. Teikyo Univ.); Kôshun (Hengchun), Kuraru, Feb. 1911, fl.–fr., T. Kawakami & S. Sasaki s.n. (TI); Kôshun, Kikaku, Aug. 24, 1925, fl., Y. Yamamoto s.n. (TI); Woluanpi, Dec. 8, 1968, fr., M. Mizushima s.n. (TI); Garanbi (Woluanpi)–Kuraru, Sept. 25, 1965, fl., I. Sasaki 542 (TI); Kuraru, alt. 170 m, Aug. 1934, fl., J. Linsley Gressitt 486 (L); Sin-taiwu–Tawushan, alt. 1000–1670 m, Jul. 16, 1968, T. Namba et al. 204 (TI); Kuaiku–Hsin-macha, Jul. 20, 1968, late fl., T. Namba et al. 217 (TI); Akô, Raisha, between 1912–1926, fl., T. Soma 1098 (TI).

Hualien Co.: Around Mt. Chingshui, alt. 1150–1400 m, Apr. 1, 1961, T. Shimizu & M. T. Kao 11905 (KYO); foot of Mt. Lanshan, cult'd in Taipei, Aug. 1969, C. C. Hsu C197 (TAI); Suigen (Shuiyuan), foot of Mt. Lanshan, Oct. 18, 1987, cult'd at Teikyo Univ., Tokyo, Jul. 14, 1991, fl., Apr. 23, 1992, fr., Jul. 28, 1995, fl., N. Tanaka, s.n. (Herb. Teikyo Univ.); Tien-hsiang, Aug. 20, 1967, C. S. Kuo et al. 6990 (TI);

Tien-hsiang–Tailuko, Oct. 15, 1965, fl., I. Sasaki 8 (TI).

Taitung Co.: Isl. Lanyu (Isl. Botel Togabo), vicinity of Langtao village. Aug. 31, 1968, fl., C. C. Hsu 4964 (TAI); same island, Wangnanchiau, Tengchi, alt. 20–350 m, Nov. 12, 1982, Tateishi et al. 15271 (TI 1348010); same island, Aug. 5, 1965, fl., T. Namba et al. 1752 (TI); same island, Mt. Hon-tou, Sept. 20, 1972, T. C. Huang & M. T. Kao 6215 (TNS 338468); same island, Yi-zun-tsuan, Aug. 26, 1969, fl., T. C. Huang & M. T. Kao 5097 (TNS 270736); same island, Tien-chi, Mar. 1988, cult. at Teikyo Univ., Tokyo, Nov. 15, 1990, fl., C. E. Chang s.n. (Herb. Teikyo Univ.); collect. at Kueihu, cult. in Taipei, Aug. 1969, fl. (bud), C. C. Hsu C016 (TAI); collect. at Chihpen, cult. in Taipei, Aug. 1969, C. C. Hsu C158 (=Kao 7144), C217, C218, C220–224 (TAI); Chushuipo, Mar. 22, 1932, fr., S. Sasaki s.n. (TNS 145748); collect. at Chushuipo, cult. in Taipei, Aug. 1969, C. C. Hsu C206, C309 (TAI); Yenping-distr., Kuanshan National Forest, alt. 700–800 m, Dec. 12, 1968, fl., M. Mizushima s.n. (TI); Chulu, Aug. 18, 1968, fl., T. Namba et al. 214 (TI).

JAPAN. Ryukyus: Yonaguni Isl., Mt. Kubura, Sept. 29–Oct. 3, 1973, Hatusima et al. 35988 (RYU 14929); same loc., Jul. 27, 1993, cult. at Teikyo Univ. (plant no. 9), Tokyo, Oct. 27, 1994, fl., N. Tanaka s.n. (Herb. Teikyo Univ.).

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References

(For those not listed below see the synonymy list in the text)

- Fujimoto Y. 1972. Yonaguni-jima no Seibutsu: 76. Kônan Shuppan-sha, Kobe (in Japanese).
- Hayata B. 1917. *Ophiopogon japonicus*, *O. japonicus* var. *umbraticola*. General Index to the Flora of Formosa: 83. Government of Formosa, Taihoku.
- Hsieh A.T. and Yang T.I. 1969. *Ophiopogon japoni-*

- cus, *O. japonicus* var. *umbraticola*. Nomenclature of Plants in Taiwan: 244. Coll. Agr. Nat. Taiwan Univ., Taipei.
- Kawakami T. 1910. *Ophiopogon japonicus*, *O. japonicus* var. *umbraticola*. A List of Plants of Formosa: 120. Government of Formosa, Taihoku.
- Li G.Z. 1999. *Ophiopogon reversus*. A study on taxonomy and geographical distribution of Liliaceae from Guangxi. *Guihaia* **19**: 39.
- Liu T.S. and Ying S.S. 1978. *Ophiopogon japonicus*. In: Li H.L. et al. (eds.), *Flora of Taiwan* **5**: 65. Epoch Publ. Co., Taipei.
- Makino T. and Nemoto K. 1925. *Ophiopogon japonicus*, *O. japonicus* var. *umbraticola*. *Flora of Japan*: 1270. Nipponshokubutsusoran Publ. Assoc., Tokyo.
- 1931. *Ophiopogon japonicus*, *O. japonicus* var. *umbraticola*. *Flora of Japan*, 2nd ed.: 1559. Shunyôdô, Tokyo.
- Masamune G. and Shimada H. 1936. *Ophiopogon japonicus*, *O. japonicus* var. *umbraticola*. In: Masamune G. (ed.), *Short Flora of Formosa*: 271. Kudoa, Taihoku.
- Matsumura J. and Hayata B. 1906. *Ophiopogon japonicus* var. *umbraticola*. *Enumeratio Plantarum in Insula Formosa sponte crescentium*. *J. Coll. Sci., Imp. Univ. Tokyo* **22**: 427.
- Miyawaki A., Suzuki K., Fujiwara K. and Miyagi Y. 1978. *Vegetation der Insel Yonakuni*. Tourist Resources Conservation Foundation, Tokyo.
- Ohwi J. 1965. *Ophiopogon*. In: Meyer F.G. and Walker E.H. (eds.), *Flora of Japan*: 308–309. Smithsonian Inst., Washington, D.C.
- Sasaki S. 1928. *Ophiopogon japonicus*, *O. japonicus* var. *umbraticola*. *List of Plants of Formosa*: 107. Natural History Soc. of Formosa, Taihoku.
- 1930. *Ophiopogon japonicus*. *A Catalogue of the Government Herbarium*: 127. Gov. Res. Inst., Taihoku.
- Tanaka N. 2001. Taxonomic notes on *Ophiopogon* (Convallariaceae) of East Asia (I). *J. Jpn. Bot.* **76**: 59–76.
- Tanaka T. and Odashima K. 1938. *Ophiopogon japonicus*. A census of Hainan plants. *J. Soc. Trop. Agr.* **10**: 388.
- Walker E.G. 1976. *Ophiopogon jaburan*. *Flora of Okinawa and the Southern Ryukyu Islands*: 309. Smithsonian Inst. Press, Washington, D.C.
- Wright C.H. 1903. *Ophiopogon japonicus* var. *umbraticola*. In: Forbes F. B. and Hemsley W. B. (eds.), *An Enumeration of All the Plants known from China Proper, Formosa, Hainan, Corea, the Luchu Archipelago, and the Island of Hongkong*. *J. Linn. Soc.* **36**: 78.
- Yang T.I. 1982. *Ophiopogon japonicus*. A List of Plants in Taiwan: 357–358. Natural Publ. Co., Taipei.

田中教之：東アジア産ジャノヒゲ属（スズラン科）の分類学的検討（II）

中国海南省海南島から記載された *Ophiopogon reversus* C.C.Huang が、香港、台湾、琉球列島西南部の与那国島にも分布することを報告した。本種の花は日中開く一日花であることなど、ジャノヒゲ (*O. japonicus*) とノシラン (*O. jaburan*) に共通する特徴を多く持ち、また、いくつかの点（葉や花茎など）で両種の間間的性質を示す。本種はこれまでジャノヒゲ、ノシラン、オオバジャノヒゲ (*O. planiscapus*) などに同定され記録され

てきた。本種の小型で狭葉を持つものはジャノヒゲに、大型で比較的広い葉を持つものはノシランによく類似する。しかし、ジャノヒゲとは、花茎長に対する花序の長さの割合、根の塊状部の形態、葉や花茎の巾などで、ノシランとは、花柄の長さ、花の大きさ、葯の色、葉や花茎の巾などで区別しうる。本種にヨナグニノシランの和名を新たに与えた。（帝京大学文学部教育学科）